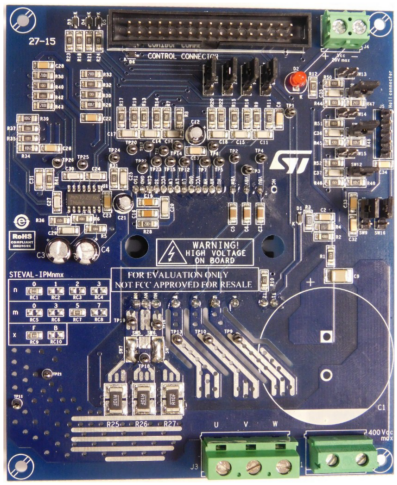
STEVAL-IPM05F

Data brief

500 W motor control power board based on STGIF5CH60TS-L SLLIMM™ 2nd series IPM



Product summary	
STEVAL-IPM05F compact motor drive power board	STEVAL-IPM05F
STGIF5CH60TS-L SLLIMM™ 2nd series IPM	STGIF5CH60TS-L

Features

- Input voltage: 125 - 400 V_{DC}
- Nominal power: up to 500 W
- Nominal current: up to 3.0 A
- Input auxiliary voltage: up to 20 V DC
- Single or three-shunt resistors for current sensing (with sensing network)
- Two options for current sensing: dedicated op-amps or through MCU
- Overcurrent hardware protection
- IPM temperature monitoring and protection
- Hall sensor or encoder input
- Uses the STGIF5CH60TS-L IGBT intelligent power module from the 2nd series of SLLIMM™ IPMs
- 32-pin motor control connector for interfacing with ST MCU boards
- Universal conception for further evaluation with breadboard and testing pins
- Very compact size
- RoHS compliant

Description

The STEVAL-IPM05F is a compact motor drive power board based on the SLLIMM™ (small low-loss intelligent molded module) 2nd series product, STGIF5CH60TS-L. It provides an affordable and easy-to-use solution for driving high power motors for a wide range of applications such as white goods, air conditioning, compressors, power fans, high-end power tools and generally 3-phase inverters for motor drives. The IPM itself consists of short-circuit rugged IGBTs and a wide range of features including undervoltage lockout, smart shutdown, temperature sensing and NTC, and overcurrent protection.

The main characteristics of this evaluation board are its small size, minimal BOM and high efficiency. It consists of an interface circuit (BUS and Vcc connectors), bootstrap capacitors, snubber capacitor, hardware short-circuit protection, fault event signal and temperature monitoring. In order to increase flexibility, it has been designed to work in single or three-shunt configuration and with double current-sensing options such as using three dedicated on-board op-amps, or op-amps embedded in the MCU. The Hall/Encoder part completes the circuit.

Thanks to these advanced characteristics, the system has been specifically designed to achieve fast and accurate current feedback conditioning, satisfying the typical requirements for field-oriented control (FOC).

The STEVAL-IPM05F is compatible with ST's STM32-based control board, enabling designers to build a complete platform for motor control.

1 Schematic diagrams

Figure 1. **STEVAL-IPM05F circuit schematic (1 of 6)**

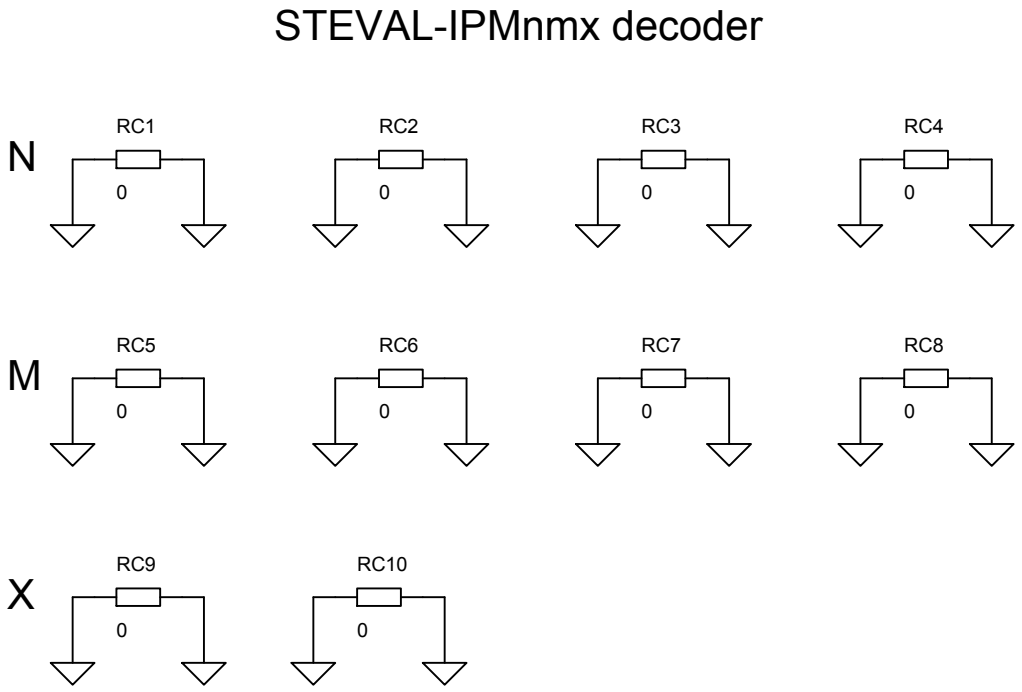


Figure 2. **STEVAL-IPM05F circuit schematic (2 of 6)**

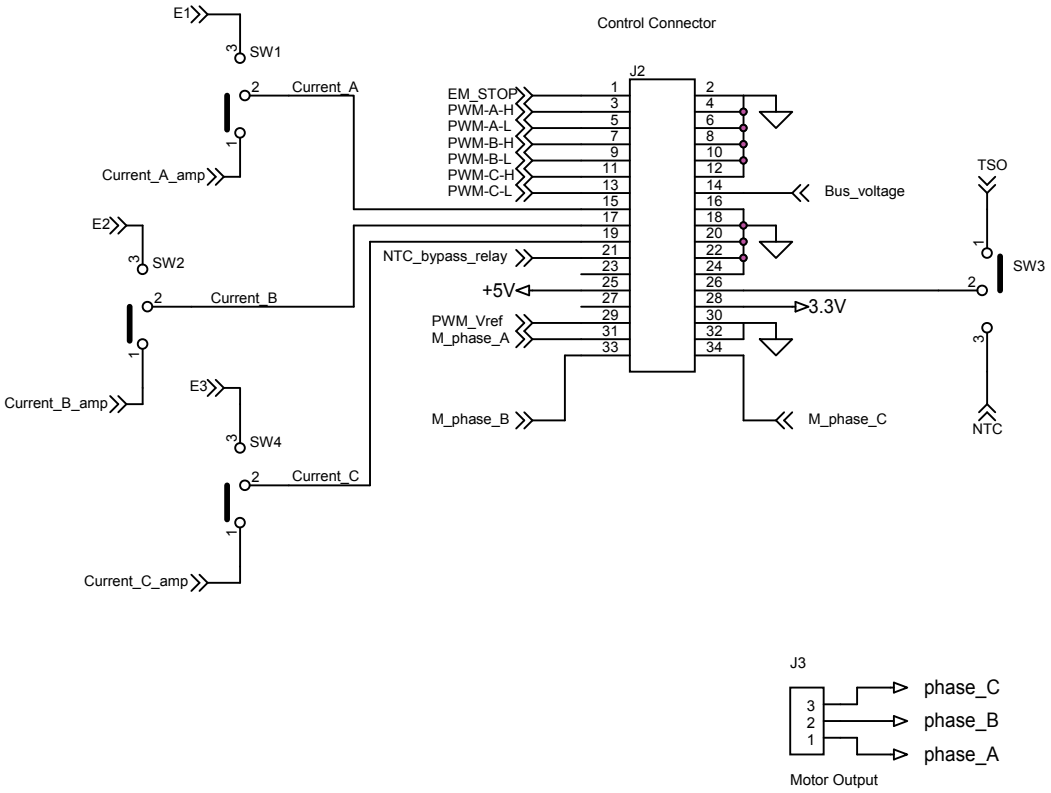


Figure 3. STEVAL-IPM05F circuit schematic (3 of 6)

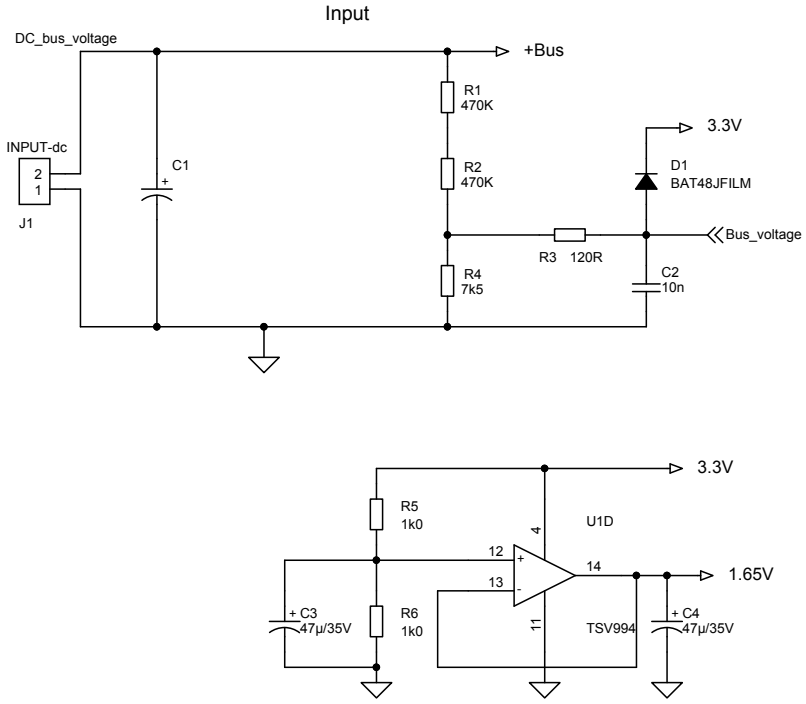


Figure 4. **STEVAL-IPM05F circuit schematic (4 of 6)**

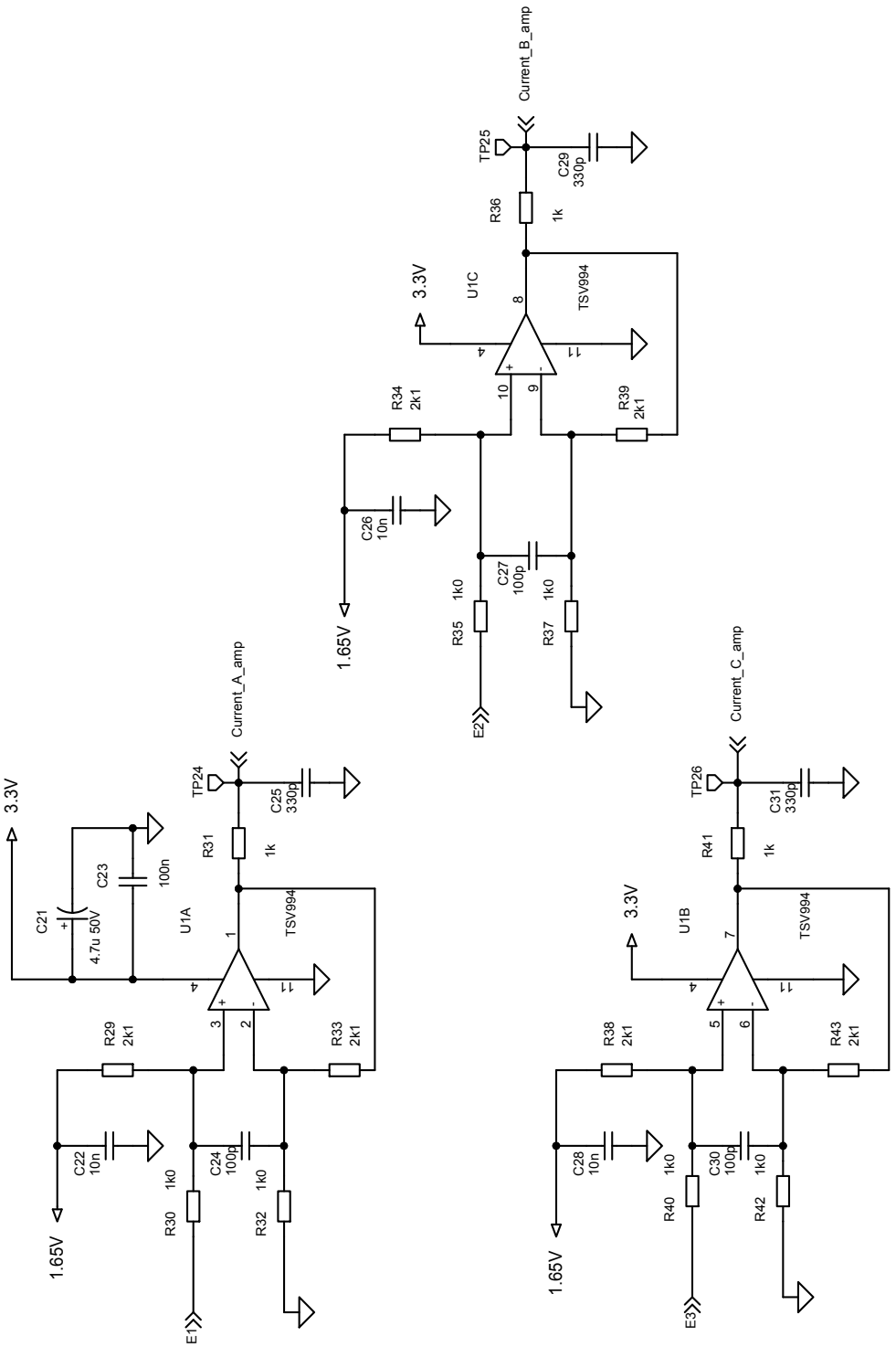


Figure 5. **STEVAL-IPM05F circuit schematic (5 of 6)**

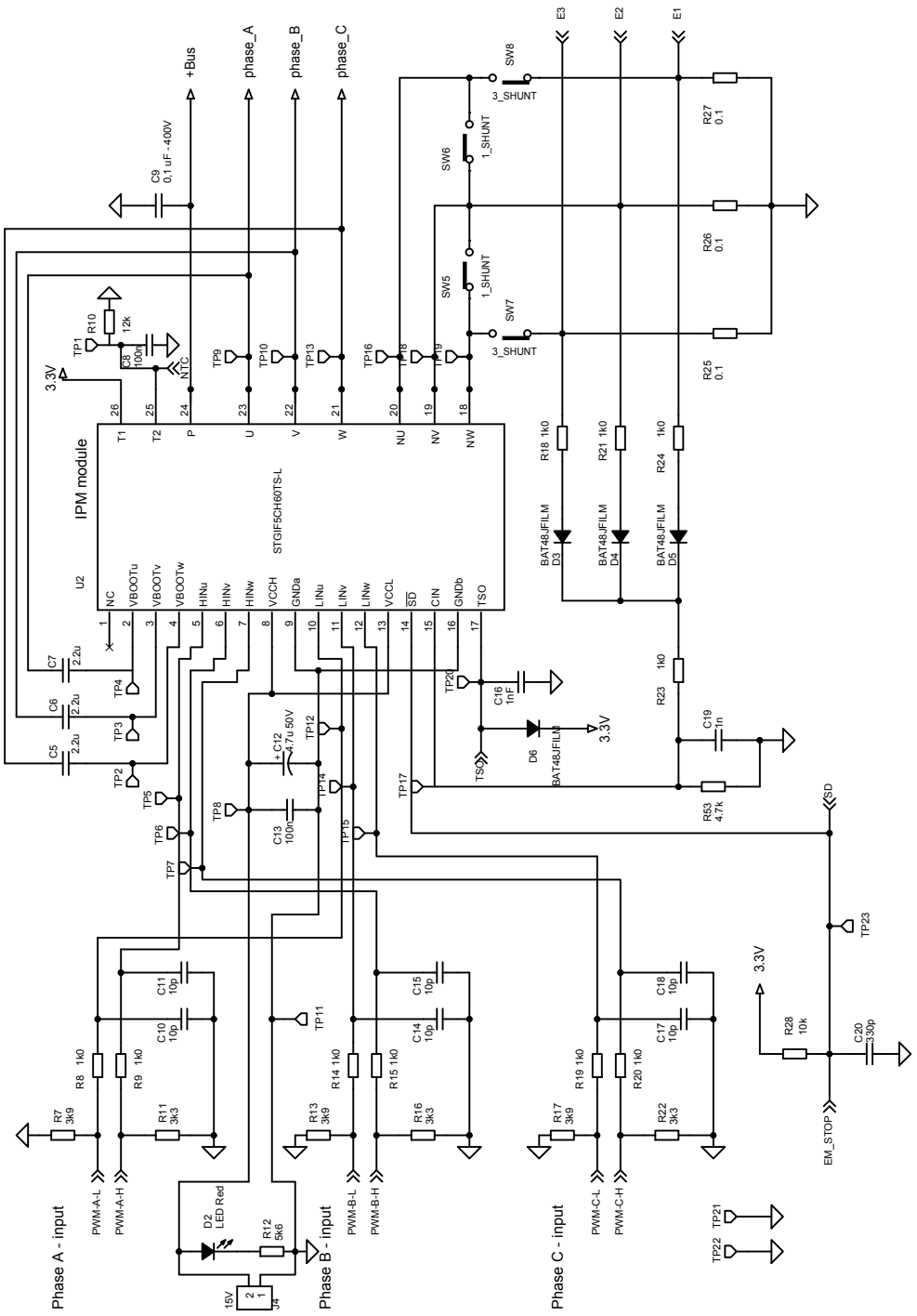
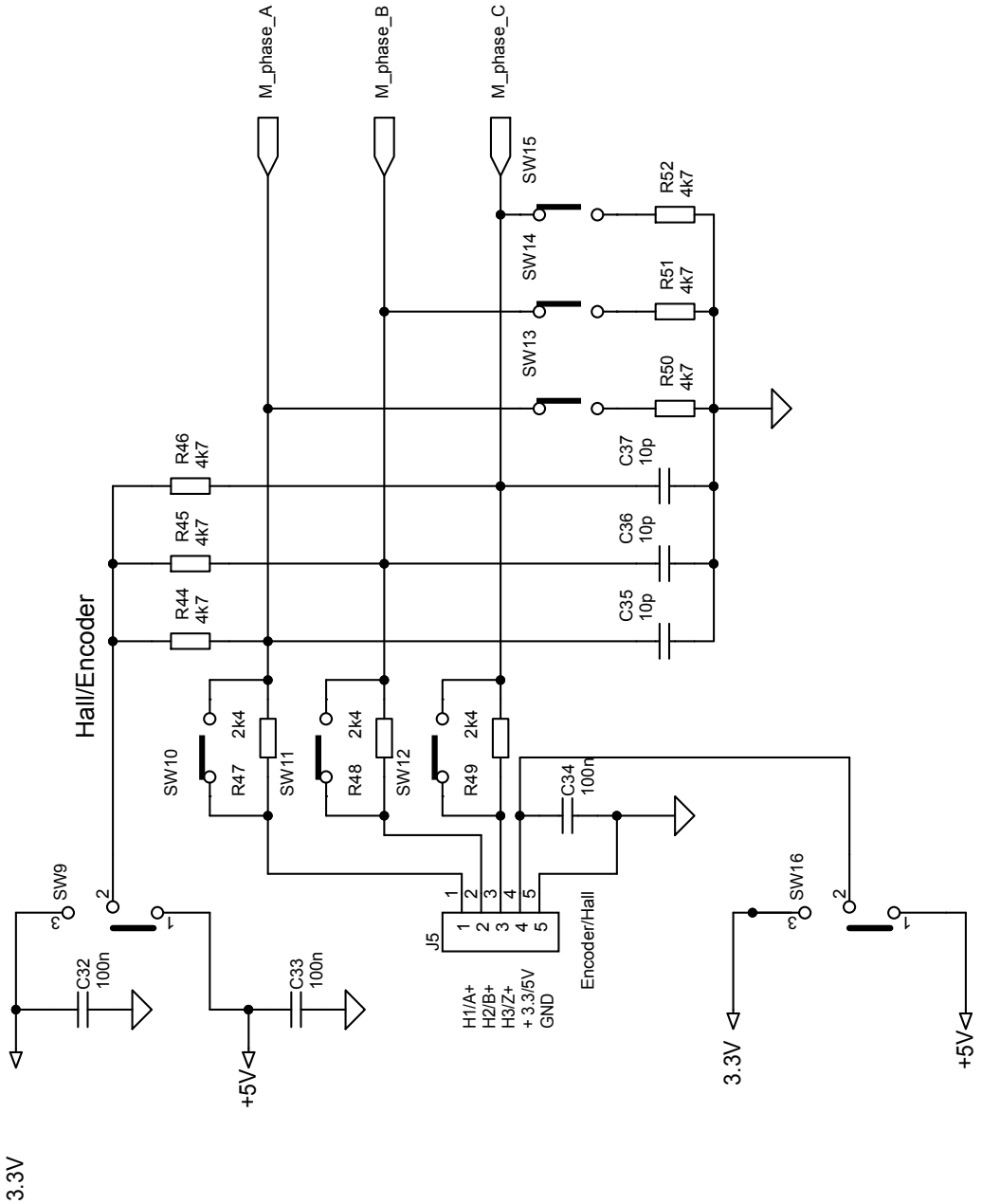


Figure 6. **STEVAL-IPM05F circuit schematic (6 of 6)**



Revision history

Table 1. **Document revision history**

Date	Version	Changes
23-Oct-2015	1	Initial release.
26-Oct-2015	2	Updated document title and part number references.
09-Mar-2016	3	Updated Schematic diagram
04-Apr-2018	4	Updated document title, features in cover page and Schematic diagrams.
16-Sep-2019	5	Updates Figure 3. STEVAL-IPM05F circuit schematic (3 of 6) and Figure 4. STEVAL-IPM05F circuit schematic (4 of 6)

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